FT-2000 OC-48 Lightwave System

A Field-Proven Solution for High-Speed Transport Applications

As the demands on today's synchronous networks increase, you need solutions for increasing speed and capacity.

With the FT-2000 OC-48 Lightwave System, you'll have a flexible solution for a wide variety of applications such as:

- interoffice applications
- outstate links
- long haul environments
- high-capacity loops

What's more, you'll have a solution that works in your existing asynchronous and Synchronous Optical Network (SONET) environment *and* allows for a smooth transition to the evolving Dense Wavelength Division Multiplexing (DWDM) network of the future – helping you protect your equipment and training investment.

The FT-2000 Platform

The FT-2000 OC-48 Lightwave System is a high-capacity SONET-based lightwave system that transmits digitally-encoded information through single-mode optical fibers at the OC-48 signal rate of 2.488 Gb/s.

The system consists of three equipment and software configurations designed to support several high-speed transport applications. These configurations include:

- FT-2000 OC-48 Add/Drop Ring Terminal
- FT-2000 OC-48 Dual Lightwave Terminating Bay
- FT-2000 OC-48 Repeater Bay

To give you maximum flexibility, the system software is designed to allow upgrades to new features as they become available.
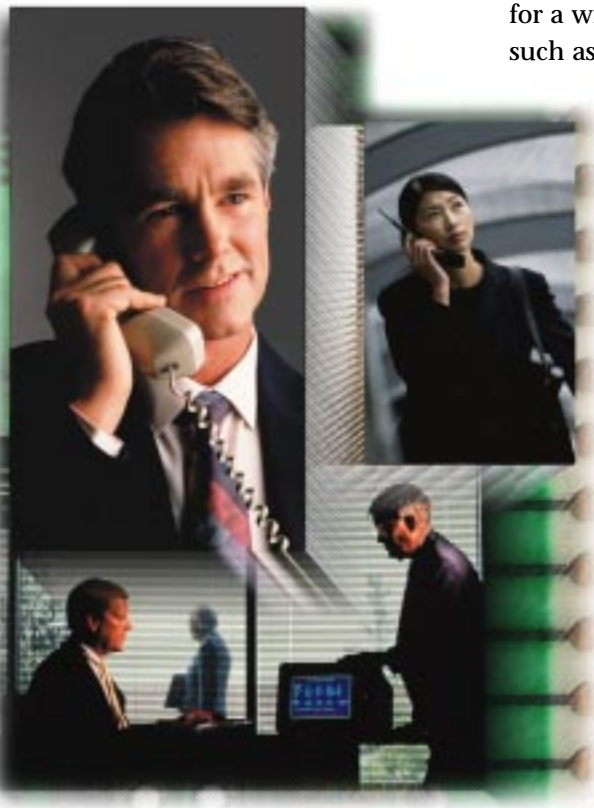
The overall system provides multiplexing, demultiplexing, and transport for up to 48 DS3 equivalent signals over two high-speed OC-48 lines. It accepts a combination of asynchronous and synchronous signals, which allows you to use the FT-2000 OC-48 Lightwave System in your existing asynchronous and SONET environment *and* will help provide a smooth transition to emerging DWDM networks.

FT-2000 Low Speed Interfaces include:

Asynchronous low-speed interface
  • DS3
Synchronous low-speed interfaces
  • Electrical carrier level 1 (EC-1) (51.84 Mb/s)
  • Optical OC-3 signal (155.52 Mb/s)
  • Optical IS-3 signal (155.52 Mb/s)
  • Optical OC-12 signal (622 Mb/s)

Supports dense wavelength division multiplexing

It's no secret. Customers are devouring bandwidth faster than many Service Providers can supply it. Understanding these pressures is easy. Relieving it may seem much harder.

Lucent Technologies has Optical Networking Solutions that can help solve this problem — FT-2000 is an integral part of this solution. The Lucent Optical Networking solution provides you with an economical and flexible means to add the bandwidth you need when your customers need it. By using DWDM technology, the Lucent Optical Line System (OLS) can provide up to 16 times the bandwidth over a pair of fibers compared to Time Division Multiplexing (TDM) techniques.

Additionally, FT-2000 offers you OLS-ready optics which enable you to directly terminate FT-2000 on the OLS.

Economical and flexible DWDM solutions for metropolitan areas

DWDM was once thought only to be a viable solution for long distance applications. Now, Lucent Technologies has developed an economical and flexible DWDM solution for metropolitan/high density urban applications.

The Lucent Optical Networking Metropolitan Solution offers you a full portfolio of low speed interfaces enabling you to add the bandwidth you need at the rate your customers require. The OLS offers you an efficient means to terminate OC-3, OC-12, OC-48, and other asynchronous/ATM-based services via a Broadband Unit. The Broadband Unit will support any interface in the 150-700 Mb/s range.

Smaller footprint saves floor space

The FT-2000 OC-48 Add/Drop-Ring Terminal can be mounted in a single 7-foot bay. All the operations, maintenance, and provision functions are built in.

Dual-Ring Interworking

Helping Keep Revenues Flowing Into Your Business

In this standard DRI configuration, the DRI is limited to 24 STS-1 tributaries in one rotation around the ring.
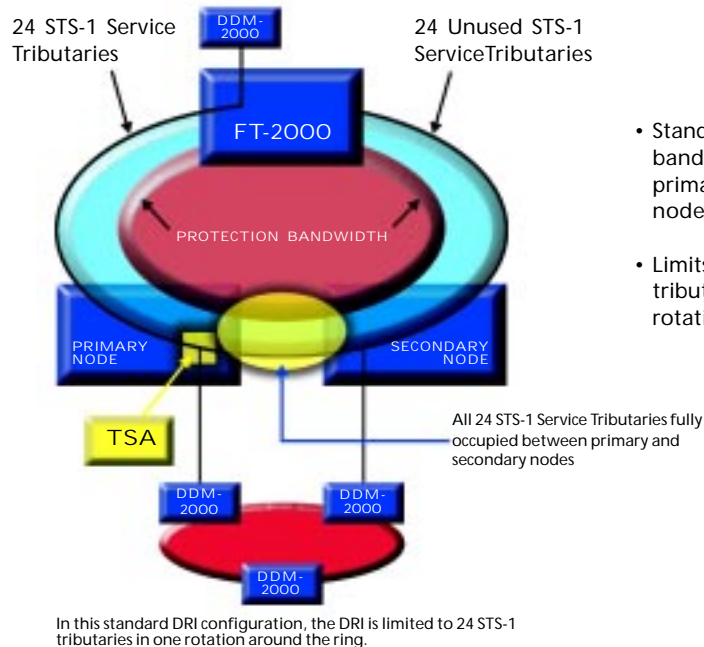
- Standard DRI uses service bandwidth between primary and secondary nodes.

- Limits DRI to 24 STS-1 tributaries in one rotation around the ring.

Enhanced DRI uses protection bandwidth between primary and secondary nodes. DRI circuits can use tributaries in opposite rotation around the ring.
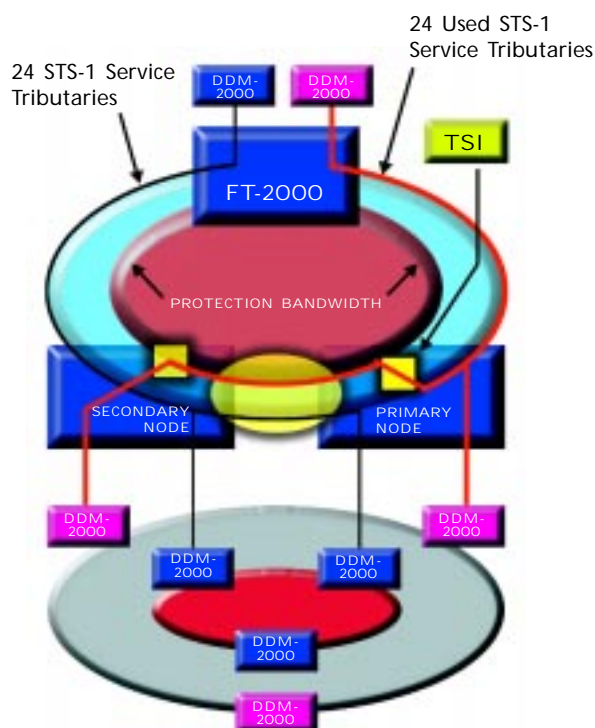
- Enhanced DRI uses protection bandwidth between primary and secondary nodes.

- Allows DRI circuits to utilize service tributaries in the opposite rotation around the ring.

- Intended to protect against primary node failures. Not as robust as standard DRI during double failure scenarios.

- Special provisioning rules in effect.

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Where floor space is limited, you can mount *two complete* FT-2000 OC-48 Add/Drop-Ring Terminals in a single 7-foot bay with the FT-2000 OC-48 Dual Lightwave Terminating Bay. This option saves precious floor space, and helps reduce your site preparation costs.

The FT-2000 OC-48 Repeater Shelf can be miscellaneously mounted and provides regenerators for point-to-point and ring applications.

Synchronization flexibility

To simplify your transition from an asynchronous environment to a SONET-standard network, your FT-2000 OC-48 Lightwave System can be provisioned in a variety of synchronization configurations, such as:

- A free-running asynchronous operation
- Through timing from both east and west incoming high-speed signals
- External timing from the digital synchronous network by DS1 references

Supports two types of protection access

With the FT-2000 OC-48 Lightwave System, you can support either pre-emptible or non-preemptible protection access at the STS-1 tributary level.

Easy to Use Operations Support Systems

No SONET solution would be complete without an Operations System (OS) to help manage and maintain the network. Lucent Technologies offers two operations support systems; Integrated Transport Management (ITM) Subnetwork Controller (SNC) and CPro-2000.

ITM SNC supports larger networks with many subnetworks. ITM SNC performs configuration management and interfaces with fault management and provisioning OSs. ITM SNC also supports multivendor networks.

CPro-2000 supports smaller networks or subnetworks of up to 50 network elements at a time.

The PC-based product uses real-time information about the network elements to provide configuration and inventory management of Lucent Technologies DDM-2000 Multiplexer Family, FT-2000 OC-48 Lightwave System and SLC®-2000 Access System (SONET subsystem only).

A closer look at the OSs

The single-ended operations capability of the FT-2000 OC-48 Lightwave System allows you to *centralize* your operations, administration, maintenance, and provisioning. From a single

FT-2000 is an OC-48 Bi-directional Line-Switched Ring (BLSR)
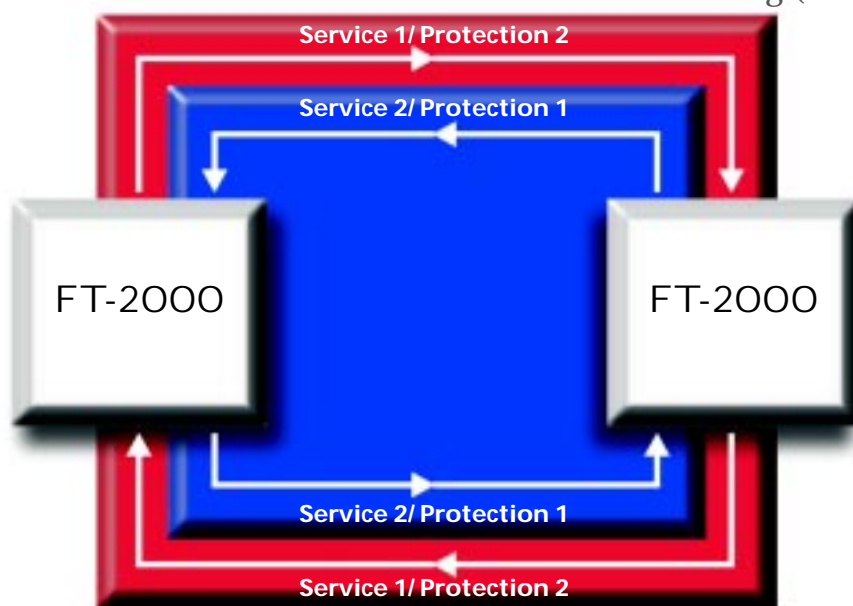
The FT-2000 OC-48 Add/Drop-Ring Terminal supports two-fiber bi-directional line-switched rings. The rings are standards-compliant and support the maximum number of nodes allowed by the SONET standard — 16 nodes. They perform automatic protection switching, restoring traffic in 60 milliseconds or less for catastrophic failures in rings without existing switches and extra traffic.

remote location, you can access any remote Lucent Technologies network elements that reside in the same SONET subnetwork. It means much less travel time and expense and no need for ring controllers or mediation devices.

The operations interworking capabilities include:
- Gateway Network Element remote operations system access
- Remote login (remote craft access)
- Remote network element status (remote alarming, alarm groups, Alarm Gateway Network Element, status of remote alarms, remote office alarms, and parallel telemetry)
- Remote software copy

An automated, graphical tool simplifies provisioning
With the FT-2000 OC-48 Add/Drop-Ring Terminal, you can provision network elements *without* manually entering a long list of TL1 commands. The terminal works with the CPro-2000, a graphical Windows-based tool that automates the operation of transmission network elements. With CPro-2000, a few simple mouse clicks allow you to:
- display, enter, and delete cross-connections at each network element and for the entire subnetwork

- obtain inventory and display a graphical "map" of the subnetwork configuration, equipment, and cross-connections from the network elements
- perform an analysis of the subnetwork element and save it to an ASCII file
- back-up and restore the network element database

You simply make your selections from graphical menus and options on screen, and CPro-2000 automatically generates the TL1 commands needed to perform the task. For example, if you're provisioning paths within a single ring, the system:
- prevents provisioning errors by comparing the new provision information with subnetwork inventory
- determines the next node in the subnetwork to provision
- ensures that the timeslots are available throughout the circuit path
- logs into each of the nodes
- establishes all cross-connections, including pass-through connections

To learn more about the FT-2000 OC-48 Lightwave System, please contact your Lucent Technologies sales representative.

Visit our web site at http://www.lucent.com

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